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HYOSCYAMUS MUTICUS.

By Edwin Dowzard.

The nature of the alkaloid occurring in *Hyoscyamus muticus* was not known until Dunstan and Brown (*Journ. Chem. Soc. Trans.*, 1899) proved that hyoscyamine was the sole alkaloidal constituent. This work was done on material obtained from India, the drug contained about 0·1 per cent. of alkaloid. In a subsequent note Dunstan and Brown (*Proc. Chem. Soc.*, 1900) reported that Hyoscyamus muticus grown in Egypt is much richer in hyoscyamine than the Indian variety. Gadamer (*Arch. Pharm.*, 1898, 236, 704) also states that the Egyptian variety contains a much larger proportion of alkaloid. Ransom and Henderson (Year Book of Pharm., 1903) have examined the latter variety with the following results :

	Percentage of alkaloid in the dried drug.
1. Stalk, etc.	0·498
2. Leaf, etc.	0·900
3. Seed capsule	0·585

According to Floyer (Year Book Pharm., 1903) : " The plant grows wild all over Egypt, where it is known by the name of 'Sakran,' the drunken. In the rich soil of the Valley of the Nile the plant luxuriates, and one shrub weighs when fresh as much as sixty pounds. There it makes large succulent leaves, but does not give a very large amount of seeds. In light sandy soil the plant has less leaf and more flowers, and in coarse sandy soil the root is very largely devel-

oped, the leaves become less and less and the seed vessels more and more numerous. A plant growing in coarse sandy soil will sometimes ripen 5,000 seed pods. Though each pod may well contain 100 seed grains, the plant does not, in coarse sandy situations, cover any large area of ground. Under similar circumstances any kind of erodium will fill whole valleys. But the muticus always remains sporadic. It will, therefore, not be surprising to find that the plant is difficult to grow. The seeds germinate, but an enormous percentage do not reach a height of three inches. The plant does not bear submersion, and such plants as spring up in ground flooded by the high Nile are strictly annual. But those above reach of water attain an age of from three to five or perhaps six years, giving each year more seeds and fewer leaves. It has yet to be ascertained whether a five years' plant contains more alkaloid than a first year's plant."

Recently a large quantity of henbane appeared on the American market, which contained an extremely high percentage of alkaloid. An examination of different parts of the plant gave the following results:

	Percentage of Alkaloid.
Whole drug	0.75
Root	0.83
Stem	0.48
Leaf	1.34
Seed	1.17

As the Egyptian variety of Hyoscyamus muticus is the only species of henbane known to contain alkaloid in such proportions, it was surmised that the drug consisted of the above species. This proved to be the case, the plant being identified as Hyoscyamus muticus.

In order to ascertain if the active principle consisted of one or more of the mydriatics, a quantity of alkaloid was separated by the following process:

Four thousand grammes of the powdered drug was percolated with 94 per cent. alcohol until nearly exhausted. The percolate was concentrated to a thick syrupy liquid in vacuo and the alkaloid shaken out with 2 per cent. hydrochloric acid. The acid solution was filtered, made alkaline with ammonia and shaken out repeatedly with chloroform. The chloroformic solution was then extracted with 2

per cent. hydrochloric acid. To the latter solution a slight excess of ammonia was added and the alkaloid shaken out with chloroform. After evaporating the solvent in vacuo, about 26 grammes (0·65 per cent.) of slightly colored crystalline alkaloid was obtained.

A portion of the alkaloid was dissolved in acidulated water and the alkaloid fractionally precipitated with auric chloride. Six fractions were obtained, each fraction was then dissolved in hot acidulated water and fractionally crystallized; three fractions were obtained from each fractional precipitate, or eighteen fractions in all. The aurichlorides thus obtained were dried at about 100° C. and their melting points determined, with the following results:

MELTING POINTS OF AURICHLORIDE FRACTIONS.

	No. 1			No. 2			No. 3		
Fractional precipitates	157·5° C.			161° C.			161° C.		
Fractions obtained by crystallization	160.	157.5	158·5	161·	161.5	161·	161.	161·5	160·5

	No. 4			No. 5			No. 6		
Fractional precipitates	161·5° C.			161·5 C.			160·5° C.		
Fractions obtained by crystallization	160.	161·5	160·5	162·	162·	161·	161·5	161·	160·5

Maximum M. P. . . . . 162° C.
Minimum " " . . . . . 157·5° C.

The following are the melting points of the three principal mydriatic aurichlorides:

	Melting Point.
Atropine aurichloride	136° to 138° C.
Hyoscyamine "	159° to 162° C.
Hyoscine "	197° to 199° C.

A portion of the alkaloid was dissolved in 2 per cent. hydrochloric acid and treated with purified animal charcoal. The mixture was then filtered, the filtrate made slightly alkaline with ammonia and shaken out with chloroform. The chloroformic solution was evaporated in vacuo, and the residual alkaloid, which was almost white, dried at about 95° C. The alkaloid thus obtained had the following characteristics:

	Melting Point.	Specific Rotatory Power.
Purified alkaloid from Hyoscyamus muticus	107° C.	—20·4° C.
Pure hyoscyamine	108° C.	—21° C.
" atropine	111° C.	Inactive.
" hyoscine	liquid at ordinary temperatures.	lævorotatory.

The above figures show that the alkaloid consists of practically pure hyoscyamine.

Ransom and Henderson (Year Book Pharm., 1903) prepared standardized tinctures from Hyoscyamus muticus, Egyptian, for the purpose of therapeutic examination. Mr. W. A. Shann, M.B., reported as follows:

"I have a very strong impression that the tincture of *Hyoscyamus muticus* is markedly superior to the ordinary tincture. In the first case in which I tried it—a case of inflammation of the bladder—the relief was immediate, and my subsequent experience has confirmed me in the opinion that it is a reliable preparation of considerable therapeutic value. I have found, too, that smaller doses were required than of the ordinary B. P. official tincture (not standardized), and I now always prescribe it in preference to the ordinary tincture."

The Egyptian variety of *Hyoscyamus muticus* is evidently equal if not superior in therapeutic value to the official drug, and would yield more elegant preparations than the latter. As the drug can be obtained in large quantities, I think the question of its use in Western medicine should be taken up.

Analytical Department Parke, Davis & Co.,
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OIL OF BERGAMOT.

By Edwin Dowzard.

The constituents of bergamot oil which have so far been identified are: linalyl acetate, linalol, limonene and bergaptene. H. v. Soden and W. Rojahn (*Pharm. Zeit.*, **46**, 1901, 778) have, in addition to bergaptene, isolated another crystalline compound. This new body has been named "bergaptin." Burgess and Page (*Jour. Chem. Soc.*, **85**, 1904, 1327) have also detected free acetic acid, an octylene, pinene and camphene. Schimmel & Co. criticise the

work of Burgess and Page (Report, April-May, 1905) as follows: "In spite of the statement made by the authors that they had to deal with an unsophisticated bergamot oil (the purity of the oil is by no means proved by the constants mentioned by the authors), we beg to doubt as yet the presence of octylene, pinene and camphene in pure bergamot oil, as in the course of this winter we were more than once able to convince ourselves of the large dimensions which the adulteration of bergamot has acquired."

The constituent which has received most attention is linalyl acetate, which, although modified by other bodies, gives the characteristic odor to bergamot oil. Linalyl acetate is present in the pure oil to the extent of about 32 to 40 per cent.; this refers only to the pressed oil, as that obtained by steam distillation from the pressed residue contains a low percentage of ester, due to decomposition. The following table shows the low ester content of distilled oils (Schimmel, Report, April, 1893):

	Specific Gravity 15° C.	Rotation 100 m.m.	Solubility in 1·5 to 2 Vols. 8 Per Cent Alcohol.	Ester Per Cent.
1. From residue after pressing,	·873	+11° 20′	Soluble	12·4
2. From residue after pressing,	·873	+4°	Soluble	12·0
3. Oil of 40 per cent. ester, rectified,	·871	+20° 40′	Soluble	22·0

The color of bergamot oil is due to the presence of chlorophyll, although copper may be present in some cases. We have examined twenty-three samples of oil and have not been able to find copper.

The following test was used: 10 c. c. of oil are shaken with 3 drops of concentrated hydrochloric acid for 30 seconds, 5 c. c. of water are added and the mixture again shaken. After the mixture has separated, 1 drop of 5 per cent. potassium ferrocyanide solution is added to the aqueous layer. If copper be present, a reddish-brown coloration or precipitate is produced. Three samples of oil which gave no reaction with the above test were allowed to stand over copper foil for two days at the ordinary temperature. After this treatment, they all gave strong reactions, one of the samples yielding a considerable precipitate of copper ferrocyanide.

The following results were obtained in the examination of twenty-three samples of bergamot oil:

	Spec. Grav. 15° C.	Rotation 100 m.m.	Solubility Value.	Per Cent. Residue.	Acid Value.	Per Cent. Linalyl Acetate.	Remarks.
1.	·875	+18° 20′	160	6·6	4·9	19·6	Adulterated, probably turpentine.
2.	·885	+11° 36′	260	5·6	2·1	37·8	Normal.
3.	·881	+22° 40′	225	4·6	2·8	31·8	Normal.
4.	·889	+ 7° 52′	220	5·5	2·1	34·8	Normal.
5.	·886	+ 9° 30′	285	6·1	2·8	37·8	Normal.
6.	·869	+35°	140	4·0	1·4	20·1	Adulterated, probably lemon, citrene or orange.
7.	·886	+16° 32′	270	4·8	2·8	27·4	Adulterated, probably distilled bergamot.
8.	·884	+13° 28′	260	6·4	4·2	35·8	Normal.
9.	·884	+13° 36′	270	5·5	4·2	37·8	Normal.
10.	·882	+11°	280	6·4	2·8	37·8	Normal.
11.	·835	+ 9° 23′	255	4·6	1·4	38·6	Normal.
12.	·882	+20°	220	4·5	2·1	33·7	Normal.
13.	·872	+34°	150	4·0	1·4	23·9	Adulterated, probably lemon, citrene or orange.
14.	·886	+15° 20′	290	6·0	3·0	38·6	Normal.
15.	·883	+21°	250	5·7	2.8	32·9	Normal.
16.	·876	+34°	170	4 5	2·8	23·5	Adulterated, probably lemon, citrene, or orange.
17.	·878	+20° 36′	230	4·2	2·8	31·3	Adulterated, probably distilled bergamot.
18.	·875	+17° 20′	200	3·3	11·2	32·9	Adulterated, alcohol and free acid.
19.	·883	+10° 24′	290	5·7	2·8	35·2	Normal.
20.	·882	+20° 5′	230	4·5	2·8	33·3	Normal.
21.	·881	+10° 30′	280	4·3	2·1	35·1	Normal.
22.	·876	+40°	140	4·5	2·8	20·1	Adulterated, probably lemon, citrene or orange.
23.	·880	+22° 20′	210	4·5	2·8	30·8	Adulterated, probably distilled bergamot.

Specific Gravity.—The specific gravity limits, as given by the various authorities, are as follows:

Schimmel & Co.	·881 to ·886
Parry	·882 to ·886
Gildemeister & Hoffmann	·882 to ·886

These limits are confirmed by the results which we have obtained. All the oils in the above table, which may be classed as pure have a specific gravity varying from ·881 to ·886, except in one case (No. 4), where the specific gravity was ·889.

Rotation.—The rotation varies from + 8° to + 24° (Schimmel, Report, April-May, 1905). Gildemeister & Hoffman, also Parry, give + 8° to + 20° as the limits for pure oils. In most cases, owing to the dark color of the oil, this determination must be made in a 50 or 20 m.m. tube. The pure oils which we have examined have rotations varying between + 7° 52′ and + 21°.

Solubility.—Bergamot oil is soluble in one-fourth to one-half volume of 90 per cent. alcohol, and the solution does not become turbid on the addition of more alcohol. An accurate determination of the solubility in alcohol by the above method is out of the question; the solubility can, however, be determined by a method suggested by the writer (*Chem. and Drug.*, **53**, 958). The method is applicable to all volatile oils and has the following advantages: (1) Only one strength of alcohol is necessary; (2) the results represent the actual solubility, and (3) they are directly comparable. 5 c.c. (accurately measured) of oil are mixed with 10 c.c. of alcohol (S. G. ·799 at 15·5° C.), and water is run in from a burette, drop by drop, until the solution becomes turbid. The number of c.c. of water required to produce turbidity is multiplied by 100, the result being termed the "solubility value."

The oils which we have examined had solubility values varying from 220 to 290. Turpentine, lemon oil, orange oil, citrene and fatty oils lower the solubility value.

Residue.—Bergamot oil leaves a residue on evaporation, which consists of bergaptene (Gildemeister & Hoffmann). The non-volatile residue is present to the extent of 4·75 to 6 per cent. (Schimmel, Report, April-May, 1905). Fatty oils increase the residue, while distilled bergamot oil, lemon oil, orange oil, citrene and turpentine decrease the residue. We have found 4·3 per cent. to 6·4 per cent. of residue in pure oils.

The residue may be determined as follows: Take a small porcelain basin about 2½ inches in diameter, introduce a few grammes of sand, and in the sand place a small porcelain crucible. The appliance is dried at 100° C. and weighed. Five grammes of oil are weighed into the crucible and the oil driven off by heating to about 105° C. The residue is weighed as soon as all odor of bergamot oil has disappeared. The above apparatus is used to prevent the oil creeping over the edge of the basin.

Linalyl Acetate.—Linalyl acetate is the most important constituent of bergamot oil, and the value of the oil depends on the amount present. It is determined by saponification. According to Schimmel (Report, April-May, 1905), the linalyl acetate content varies from 34 to 40 per cent. The oil obtained from unripe fruit yields less ester (down to 30 per cent.) than that obtained from ripe fruit. An oil containing 30 per cent. of ester must, however, be looked upon with

suspicion. The results we have obtained show that the minimum amount of linalyl acetate in a pure oil may be fixed at about 32 per cent. The acid value should always be determined and allowed for, as in most cases the amount of free acid will affect the ester determination.

Distilled bergamot oil, lemon oil, orange oil, citrene and turpentine, all lower the ester content.

Adulterations.—The principal adulterants are distilled bergamot oil, lemon oil, orange oil, citrene, turpentine and alcohol. These all cause a decrease in density, and in the case of lemon oil, orange oil and citrene an increase in rotation, while all cause a decrease in ester. Fatty oils are sometimes used as adulterants, and can be detected by the increased amount of residue. Occasionally esters other than linalyl acetate may be used, and sometimes free acid, which will be detected by the increased acid value.

The constants for bergamot oil are as follows:

Specific gravity at 15° C.	·881 to ·886
Rotation, 100 m.m.	+8° to +24°
Solubility value	220 to 290
Residue	4·3 to 6·4 per cent.
Acid value	1·4 to 4·2
Linalyl acetate	32 per cent. and upwards.

FROM THE LABORATORIES OF
PARKE, DAVIS & CO.

BISMUTH SUBGALLATE AND BISMUTH SUBSALICYLATE.

BY OTTO B. MAY, PH.D.

At the time of the Pharmacopœial revision, there was considerable variation in the quality of these two commercial salts, more especially in their bismuth (Bi_2O_3) content and percentage of uncombined organic acids. In the rubric and tests, as much latitude was permitted as possible, consistent with desirable purity. Since our manufacturers have had abundant opportunity and time to replace old stock with new, an examination of our supplies was deemed advisable. In the tables appended, only the more important phar-

macopœial tests are included, all of which demonstrate that our manufacturers are doing their utmost in complying with our rigid requirements.

BISMUTH SUBGALLATE.

It will be noted that not one of the samples strictly fulfils the requirements of test for the "absence of free gallic acid" as given in paragraph 5, page 75 (U.S.P.). In order to ascertain the cause and also to determine the quantity of free gallic acid present, 5 grammes of each of the samples was thoroughly agitated with 30 c.c. of ether, filtered, washed with two further portions of 10 c.c. each, and the filtrates, after distilling off the ether, were dried over sulphuric acid and weighed. The residues, which varied from 0.02 to 0.08 per cent., consisted of fatty matter with but *traces only* of free gallic acid, the former originating evidently from the gallic acid used. Since this residue is present in very small quantities, with but traces of gallic acid, the test would be more reasonable and just, if applied in this manner, than by employing the supersensitive litmus. The following test is suggested in lieu of our present one, being less strenuous and conformed to by all of our manufacturers: "If 1 gramme of the salt be well shaken with 10 c.c. of ether and filtered through a double filter, wetted with ether, the filtrate evaporated to dryness should not leave a weighable residue, nor should an immediate blue-black coloration appear after the addition of 2 drops of ferric chloride T. S."

Weight Volume.—There being some difference in the comparative lightness (bulk) of the various samples, a simple expedient was adopted, whereby the weight volume could be approximately measured. 1.0 gramme of the sample was introduced into a narrow graduated cylinder, and then shaken down by tapping until its volume ceased to decrease; the volume was then noted.

The samples examined were taken from original sealed containers.

Sample.	Bi_2O_3	Nitrates.	U. S. P. Free G. A. Test.	Proposed G. A. Residue Test.	Ether Extract. Per Cent.	Color.	Wt. Vol.
1.	52.6	0	Positive.	None.	0.08	Bright yellow.	1.4
2.	53.6	0	"	"	0.02	Light brown.	1
3.	53.5	0	"	"	0.02	Yellow.	1
4.	55.5	0	"	"	0.02	Bright yellow.	1.5
5.	53.0	0	"	"	0.03	" "	1
6.	53.8	0	"	"	0.025	Yellow.	1.4

BISMUTH SUBSALICYLATE.

The deportment of our samples to the test for limit of free salicylic acid, paragraph 6, page 77, U.S.P., was not anticipated, in view of the results obtained a few years ago. The free acid was estimated in 5 grammes of the sample, as described under subgallate, with results varying from 0·36 to 0·48 per cent. Owing to the feeble basic properties of bismuth salicylate and the readiness with which salicylic acid is liberated during the drying, a more liberal allowance must be made in the future for free (uncombined) acid. Basing such a test upon our present market supply, we would suggest the following:

"If 1 gramme of the salt be agitated with 10 c.c. of ether, and the liquid filtered through a double filter of fine texture, wetted with ether, the filtrate, when evaporated to dryness, should not leave more than 0 004 gramme of residue consisting of salicylic acid."

Among the other tests there is considerable more variation than in the previously mentioned samples.

Sample	Bi_2O_3 Per Cent.	H_2O Per Cent.	U. S. P. Free S. A. Test.	Free S. A. Per Cent.	Color.	Nitrates.	Wt. Vol.
1.	66·6	0·2	Positive.	0·36	Gray white.	0	3.6
2.	62·5	0·2	"	0·40	Yellowish white.	0	1·0
3.	65·0	0·3	"	0·48	White.	0	3·8
4.	66·5	0·2	"	0·36	"	0	4·2
5.	64·3	0·25	"	0·34	Bright white.	0	4·8
6.	64·70	0·3	"	0·30	White.	0	6·0

March 16, 1908.

NOTES ON SOME CHEMICALS.

By Otto B. May, Ph.D.

STARCH TEST SOLUTION, U.S.P.

It is recommended that the third line following 200 c.c., replace present text (p. 538, U.S.P.) by following: "Then boil a few minutes until a thin transparent fluid is obtained."

HYDRARGYRUM CUM CRETA, U.S.P.

In response to the complaint that the tests for *mercurous* and *mercuric* oxides (p. 242, U.S.P.) are too exacting, I examined original samples of our various manufacturers. Of the six samples ex-

amined, four not only complied with the specifications (employing 0·1 gramme), but three of them gave no reaction when as much as 1 gramme of the sample was taken—a very good showing indeed. The remaining two samples gave such marked reactions that the "ous" and "ric" oxides were determined quantitatively.

	Hg_2O	HgO
No. 1	1·26 per cent.	0·22 per cent.
No. 2	None	0·093 per cent.

No sulphites or nitrates were found in either of the above. Further experiments are being conducted with the good samples in order to determine, if possible, the cause of this oxidation. On page 242 I would suggest that the words "If a portion" be replaced by "*If 0 1 gramme.*

FERROUS SULPHATE.

The American Steel and Wire Company, who are the largest producers of ferrous sulphate, desiring to comply with the requirements of the Pure Food and Drug Law, submitted average samples of their products for examination. These samples were taken from large lots representing what is known to the general trade as "Bottom Crystals," consisting of brown-colored, oxidized, irregular-sized crystals, such as are sold for technical uses only. "Prime Green," bright, clean and large crystals. "Sugar Sulphate," a slightly effloresced granular powder, corresponding to Ferri Sulphas Granulatus, U.S.P.

$FeSO_4 \cdot 7 H_2O$ of 99·5 per cent. (U.S.P.) should contain 20 per cent. of ferrous iron.

		Per Cent.	Per Cent.
"Bottom Crystals"	ferrous Sulphate	96·10	(=19·32 Fe)
	ferric Salt	2·26	(=0·633 Fe.)
"Prime Green"	ferrous Sulphate	98 00	(=19·70 Fe)
	ferric Salt	1·51	(= 0·42 Fe.)
"Sugar Salt"	ferrous Sulphate	101·6	(slightly effloresced)
"Drug Store Sample"	ferrous Sulphate	99 65	(=20 3 Fe.)
	ferric Salt	traces.	

None of the samples responded to the time limit test for foreign metals. If we consider the "Prime Green" sample pharmacopœial (20·1 per cent. Fe), classifying it among those chemicals subject to deterioration, the results demonstrate that our rubric can do injustice to no one purchasing their average "Green," crystalline or granular salts.

LABORATORY OF NEW YORK COLLEGE OF PHARMACY,
April, 1908.

LIQUOR CRESOLIS COMPOSITUS, U.S.P.

By Ferdinand Nitardy.[1]

This preparation has been subject to considerable criticism, and various suggestions toward improvement have been made. The chief cause of criticism is the fact that the U.S.P. formula will not give a clearly water-soluble product. The turbidity is due to unsaponified linseed oil. If the preparation, made according to the U.S.P. process, is allowed to stand long enough, it will become clearly water-soluble, the time required varying from ten days to six months, according to the temperature at which it is kept, and the excess of alkali present. The same result can also be obtained by heating the finished product for three hours on a water bath, but this process is inferior to the one of completely saponifying the linseed oil before adding the cresol, as it involves the loss of some cresol by evaporation, as well as danger of fire, since the cresol vapors are inflammable.

The soap formed in the U.S.P. formula for Liquor cresolis compositus contains but 14 per cent. of water, which is much less than the amount present in ordinary soft soap. The U.S.P. soft soap, containing from 40 to 50 per cent. of water, for this reason can not be substituted for this soap. On account of the small quantity of water present, saponification does not readily take place in the cold. The use of water-bath heat, and the addition of a small quantity of alcohol, to aid rapid saponification, are advisable. Under these conditions saponification is complete in from five to ten minutes.

If the potassium hydroxide, used in making the soap, is of 85 per cent. strength, the resulting soap is exactly neutral or but very slightly alkaline (the saponification number of linseed oil varies from 192 to 195, equivalent to 79·06 to 80·30 grammes of potassium hydroxide required for complete saponification of 350 grammes of linseed oil), but if the potassium hydroxide is of 90 per cent. strength, which may happen, since the potash on the market runs in strength from 85 to 88 and occasionally up to 90 per cent. of KOH, the resulting soap will contain about 0·5 per cent. of free KOH.

A neutral soap is preferable for this preparation, but the small amount of free alkali that would be introduced into the preparation

[1] Read before the Chicago Branch of the American Pharmaceutical Association.

by a soap of this kind does not materially affect its value, especially as it does not remain as free KOH in the finished product, but combines with some of the cresol, forming potassium cresolate. Any amount of free alkali will cause the preparation to become thick, 1 per cent. of KOH in excess producing a syrupy consistence, 3 per cent. a soft jelly, and 5 per cent. a very firm jelly, the germicidal value being slightly reduced.

The substitution of oleic acid, cotton seed, castor and other oils, for the linseed oil called for by the Pharmacopœia, has been suggested, but no advantage is to be gained thereby. Linseed oil soap gives a product somewhat darker than that obtained with a soap made from other oils. But the color is not uniform, as the preparation darkens with age. Cresol varies in color, and old linseed oil gives a darker product than fresh oil; otherwise, old linseed oil will not alter the preparation, as the unsaponifiable matter in it is not increased by aging, oxidation or boiling (Dr. Fendler, *Proc. A. P. A.*, vol. 52, p. 911–912), nor is its saponification number changed by age (Lewkowitsch, "Anal. of Fats and Oils," vol. II, p. 457).

Much has been said in regard to the amount of soap called for in the Pharmacopœial formula. Charles H. LaWall and E. Fullerton Cook, in a paper on Liquor Cresolis Compositus (Am. Journal of Ph., April, 1906), state that there is more soap than necessary in the preparation, this is also claimed by quite a number of pharmacists. This is true from a purely pharmaceutical standpoint.

It is possible to make a perfectly water soluble product containing:

	Per Cent.
Soap (free from water)	16·0
Glycerin (formed in the process)	1·4
Water	32·6
Cresol U. S. P.	50·0

or

Soap (free from water)	22·0
Glycerin (formed in the process)	1·9
Water (necessary for the process)	6·1
Cresol U. S. P.	70·0

For comparison I will state that the U. S.P. product contains:

	Per Cent.
Soap (free from water)	39·5
Glycerin (formed in the process)	3·5
Water	7·0
Cresol	50·0

Perfect solubility, although very desirable, is by no means the most important point in this preparation. Our first aim must be to produce a preparation of maximum efficiency as an antiseptic and germicide with the minimum amount of caustic or irritating properties. As will be seen from the following tests, the reduction of the quantity of soap in the preparation renders it excessively irritating. The tests with substances and preparations mentioned below were carried out in the following manner:

One drop of each was spread over approximately one square inch of skin on the human arm, and the action noticed and recorded at intervals. All of them were tried on several persons, so as to obtain fairly reliable results. Numbers 1 to 6 inclusive produced escharotic action in from one (phenol) to twenty (Liquor cresolis comp. containing 16 per cent. of soap and 50 per cent. of cresol) minutes. Numbers 7 to 16 inclusive only reddened the skin, while the remainder produced no noticeable irritation; these were compared as to their relative irritating properties, by noticing the effect of diluted solutions on mucous membranes. They are given in the order of their action, beginning with the most escharotic.

(1) Phenol.

(2) Liquor cresolis compositus, 8 per cent. soap, 50 per cent. cresol.

(3) Paracresol.

(4) Cresol U. S. P.

(5) Metacresol.

(6) Liquor cresolis compositus, 16 per cent. soap, 50 per cent. cresol.

(7) Orthocresol.

(8) Cresol U. S. P., alcohol, equal volumes.

(9) Liquor cresolis compositus, 24 per cent. soap, 50 per cent. cresol.

(10) Seven per cent. solution of phenol.

(11) Liquor cresolis compositus, 32 per cent. soap, 50 per cent. cresol.

(12) Five per cent. solution of phenol.

(13) Cresol U. S. P. 2 parts, alcohol 1 part, glycerin 1 part.

(14) Liquor cresolis compositus from paracresol.

(15) Potassium cresolate sol. (rep. 50 per cent. cresol).

(16) Liquor cresolis compositus (incompletely saponified).

(17) Liquor cresolis compositus (by modified process).

(18) Liquor cresolis compositus, with excess of 1 per cent. of KOH.

(19) Liquor cresolis compositus, with excess of 3 per cent. of KOH.

(20) Cresol U. S. P. and glycerin, equal parts.

(21) Liquor cresolis compositus from metacresol.

(22) Liquor cresolis compositus, with excess of 5 per cent. of KOH.

(23) Liquor cresolis compositus from orthocresol.

(24) Three per cent. solution of phenol.

It will be noticed that a preparation containing 8 per cent. of soap and 50 per cent. of cresol is more caustic and escharotic than pure cresol; probably due to the fact that the cresol is rendered soluble, and the skin softer and therefore more easily attacked by the cresol.

A preparation containing four-fifths of the required amount of soap produced a decided redness of the skin, later causing it to peel off; while the U.S.P. product made by the modified process produced no irritation. It is important that saponification be complete, as the preparation will otherwise be irritating.

According to Dr. Otto Heiler, soap increases the germicidal power of phenol and cresol by about 25 per cent. if present volume for volume. (*Proc. A.P.A.*, vol. 52, p. 563.)

The above facts tend to show that the proportion of soap present in the U.S.P. product should not be reduced.

This brings us back to the original formula, which, with the following modification in the working directions, is the best that can be produced at present.

COMPOUND SOLUTION OF CRESOL.

Cresol	500 gms.
Linseed oil	350 "
Potassium hydroxide	80 "
Alcohol	35 c.c.
Water, a sufficient quantity to make	1000 gms.

Dissolve the potassium hydroxide in 50 grammes of water in a tared dish, add the linseed oil and mix thorougly. Heat on a water bath or on a steam bath to about 70° C., incorporate the alcohol,

and continue heating until saponification is complete. Then add the cresol, stir well, cover the vessel and allow to stand, stirring occasionally until a clear solution is produced, finally add sufficient water to make the finished product weigh 1,000 grammes.

When it is desired to add volatile oils to the preparation, for the purpose of masking its odor or rendering it more pleasant, I find that up to 2 per cent. of any volatile oil can be added to the finished product without rendering it turbid or impairing its solubility. Of oils whose constituents consist mainly of substances of the phenolic type, like oil of cloves, as much as 5 per cent. may be added.

The preparation can also be mixed to advantage with such preparations as Liq. Antisepticus U.S.P.

SCHOOL OF PHARMACY OF
NORTHWESTERN UNIVERSITY.

ADULTERATION OF VOLATILE OILS.[1]

BY DRS. GEORGE R. PANCOAST AND W. A. PEARSON.

The American who ordinarily demands honest dealing and despises deception, accepts with amazing meekness the present volatile oils.

It is an open secret that sophistication is practised, due largely to the extreme pressure of competition and the demand for cheaper products. We do not say that only the highest grade should be sold, for that would greatly limit the scope of usefulness, but we do think that each grade should be sold under its proper label. It has been demonstrated that cheaper grades do not endanger the market for the best quality, but that indirectly the sale of the better grade is augmented, the cheaper grade finding new uses where the best grade is limited because of its price.

This is the true condition at Grasse, the very centre of volatile oil production, and is equally true of many of our commodities. Deception steps in when a cheap article is given for an expensive one.

The main use of volatile oils is in imparting agreeable flavors and odors to various products, thus occupying an exalted position in

[1] Read before the Philadelphia Branch of the American Pharmaceutical Association, April 7, 1908.

our æsthetic development. Unfortunately, a certain sample may be pleasing to one and obnoxious to another, and this introduces a serious problem in the valuation, namely the personal equation.

A vast amount of accurate work has been done with volatile oils in determining certain physical and chemical properties and setting limits for natural variation, but often the desirable or most valuable portion which produces the delicate aroma is not considered. The odorous constituents are often so delicate that chemical estimation is impossible. Their source is not definitely known, but it is thought that they are decomposition products from glycosides brought about by the catalytic action of certain enzymes.

The best practical method of valuation is the comparison of odors by experts. The nobility have their perfumers, whose duty it is to blend and select the odors to be used at various functions. So delicate has their sense of smell become, that only a few samples are compared each day. This, then, is the perfumer's art, he has both the natural and artificial products at his disposal, and his duty it is to combine them into a perfect harmony of pleasing odors. At present it is an art—it may become a science.

It remains to be seen whether or not there is a relation between the various odors as there is between musical tones, or of colors. Probably there is, for some will harmonize, some detract, some increase, while others will make a decided discord.

Our scientific knowledge of odors is very meagre when compared to our knowledge of light and sound. Is the sense of smell due to small particles? If so, what is their size, shape and rate of motion? Extreme smallness is not a great barrier at the present time, for particles one thousand times as small as the size we have attributed to molecules have been demonstrated in radium emanations, and these quite accurately studied. Or, is odor due to some vibration in the ether, as is light and sound? Until the day dawns when these things shall be accurately known, comparatively little progress can be made in the exact valuation of odors from volatile oils. Professor Michelson, the great American physicist, has devised an instrument called the interferometer, which will measure the length of light waves so accurately that the error is infinitesimal. Who will devise a way to measure the odors of volatile oils and thus give us an exact scientific method of valuation for these products?

At present, undoubtedly, adulteration is being practised and we

must depend largely on the integrity of the distiller. A few specific cases may well be considered.

OLEUM AMYGDALÆ AMARÆ.

Gildemeister and Hoffmann (page 437) state that only a very small amount of the bitter almond oil of commerce is prepared from bitter almonds, but is prepared mainly from the seeds of the apricot (*Prunus armeniaca*, L.), which is allowable for the U.S.P. product. Parry states ("Chemistry of Essential Oils," page 297) that the true oil may be grossly adulterated with artificial benzaldehyde, and if the purest variety be used, it is impossible to detect it within certain limits except by the odor. Formerly synthetic benzaldehyde always contained chlorinated products which made possible its detection as an adulterant.

Another adulterant is oil of mirbane, which may readily be detected by odor, the specific gravity and by its reduction to aniline with iron filings and acetic acid, which may be distilled and collected. To the distillate a few drops of calcium chloride solution is added and if aniline be present the characteristic violet color is produced. Samples adulterated with nitro-benzene when shaken with an excess of sodium bisulphite solution have the characteristic coarse nitro-benzene odor.

The official assay for benzaldehyde content is exceedingly difficult and a decided improvement was made by Roberts and Carwithen by exactly neutralizing the kerosene before beginning the assay and keeping the flask tightly corked as much as possible.

OLEUM BETULÆ, OLEUM GAULTHERIÆ AND METHYLIS SALICYLAS.

One offender says, "Methyl salicylate is just as official as oil of birch; what harm can there be in mixing them?" It is only reasonable to believe that Nature's laboratory is more efficient than our own, and this has often been demonstrated, but aside from this there is a moral obligation which should not be overlooked, even if the Pure Food and Drugs Law were not in existence.

At present there is only about one-tenth enough wintergreen leaves harvested to make the amount of oil that is actually sold. Where does the rest come from? Often, undoubtedly, the product is oil of birch or mixtures of it and synthetic methyl salicylate.

We are now investigating thoroughly the adulteration of oil of birch and wintergreen with synthetic methyl salicylate, and are very sorry our experimental work is not complete, so that it might be presented at this time, as we expected. In the very near future we hope to present the whole subject and give our distinguishing tests and methods for detection of added synthetic methyl salicylate. We solicit your co-operation on this very important subject and will greatly appreciate any data or authentic samples you may supply.

OLEUM SANTALI.

Sandal-wood is one of the most ancient perfume-bearing substances known to mankind, being, no doubt, brought by the Greeks from India as early as the conquest of Alexander. Not until the fifteenth century is any mention made of the oil distilled from the wood, when Saládinus of Æsculo described his method. It was not until 1882 that the first comprehensive examination was made by Chapoteaut. Many varieties of sandal oil are procurable and each seems to vary widely in certain particulars. Oil distilled from freshly rasped logs may have a specific gravity below 0·975, while that made from old chips, often 0·980.

Drs. Pancoast and Kebler (A. J. P., 1901) state that this oil should be from one to two years old, as the aroma is improved by age.

Undoubtedly there is naturally much difference in the physical and chemical properties of true sandal-wood oil, derived from various sources and distilled under different conditions, and we think that much of the suspicious oil on the market may be genuine. So suspicious have the manufacturers become of this oil that many firms import the wood and distill the oil, but it has been said that the yield from these billets is sometimes increased by steeping the logs in certain adulterants before leaving India.

No doubt this oil has always been subject to adulteration, at first with articles easily recognized, but of late years the adulteration has become more scientific and complex, requiring exhaustive analyses. We have grown suspicious of this oil unless its properties correspond rigidly to the requirements of our Pharmacopœia, and besides it is well to apply other tests, such as fractional distillation, as used by Parry and Bennett (*Chemist and Druggist*, July 6, 1907) when oil mixed with turpineol was found. It is also wise to take the acid number. The per cent. of santalol is of vital importance, but,

unfortunately, the present official method gives too high results in the presence of chloroform. The main difficulty in using this adulterant is in adding an excessive quantity when the indicated per cent. of santalol will be above 100 per cent. In one case 166 per cent. of santalol was indicated by adding 1 part of chloroform to 7 parts of oil, the optical rotation of this admixture was—17° 12′, specific gravity 1·033, and it was soluble in two volumes of 70 per cent. alcohol. Wielen (*Chemiker Zeitung*) has offered an improvement in the manipulation of the assay by substituting a 10 per cent. solution of sodium chloride for the water, by which time is saved and much less oil is lost by emulsification.

It would be unwise for our Pharmacopœia to give a wider range to the constants of this oil, even if some injustice is done by excluding some pure oils. The comparative narrow limits render adulteration more difficult.

OLEUM SASSAFRAS.

The main adulterant of this oil is a certain fraction of camphor oil. The detection is exceedingly difficult, providing the manufacturer does not take too large a fraction and increase the specific gravity above the limit. One chemist has reported the finding of camphor in the oil, no doubt due to a small amount present in the camphor oil used for adulteration.

Many other specific cases might be considered, but in general a comparative odor test with a sample of known purity is a very satisfactory way of valuation. Place equal amounts of the oils on filter papers in the bottom of small jars or beakers, and carefully consider the delicacy of the odors until evaporation is complete. The odor of the natural oil is very persistent. One authority states that $\frac{1}{2000}$ of a milligramme of mint can be detected in one quart of air. As a rule pure oils will retain their same fundamental odor until the end of the experiment, while an adulterated or synthetic oil will pass through a series of variations depending on the nature of the mixture. Another peculiarity of true oils is that they will impart their characteristic odor to a larger volume of liquid than their substitutes. A satisfactory odor dilution test can be made by dissolving 1 c.c. of the oil in 100 c.c. of alcohol, 1 c.c. of this is added to 99 c.c. of dilute alcohol, and 1 c.c. of this dilution added

to various volumes of water, depending on the intensity of the odor and the peculiarities of the oil.

Science is no respecter of persons and has benefited both the honest manufacturer and the rogue. This subject has been treated more comprehensively by Drs. Pancoast and Kebler in the AMERICAN JOURNAL OF PHARMACY, January, 1901, and their anticipations of a firm's displaying the placard "Essential Oils Made to Order While You Wait," has actually been realized according to Professor Remington, who says there is a London firm which builds volatile oils to order and scientifically corrects any of the constants in an inferior product.

In conclusion we wish to thank both the firm we represent and the many individuals who have contributed indirectly to this report, and we solicit your co-operation in sending us samples and data of adulterated oils, that we may do more to rid the market of spurious products.

RESEARCH LABORATORY,
SMITH, KLINE & FRENCH CO.

SOME REMARKS ON THE ADULTERATIONS OF DRUGS AND CHEMICALS AS FOUND IN PRACTICE.[1]

BY L. HENRY BERNEGAU, PH.G., A.C.

In bringing the following instances of "adulterated" drugs and chemicals before the meeting to-night, I do so with the understanding that the word "adulterated" is used in its broader sense to include drugs which may be of low strength or poor quality due to natural causes—and chemicals which may in some way, perhaps by carelessness, be "off" in strength or purity—as well as in its narrower sense of intentional sophistication. Moreover, the examples which are given are all taken from actual laboratory records of the past few weeks, as it does not take a very long time to accumulate a number of observations of possible interest in a laboratory where much work is going on.

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[1] Read before the Philadelphia Branch of the American Pharmaceutical Association, April 7, 1908.

STRAMONIUM LEAVES.

Some time ago we received a sample of a shipment of stramonium leaves in our laboratory to be identified and assayed. The drug was very dry, broken to small fragments, and it was, therefore, difficult to get hold of a good specimen. The drug contained many flowers, which were identified as stramonium flowers. At the same time we found some capsules containing small seeds; these were identified as hyoscyamus seeds. We then made four assays of the drug and found an average of 0·262 per cent. mydriatic alkaloids. This showed that the larger part of the drug was stramonium, as hyoscyamus seldom assays higher than 0·10 per cent. We most certainly rejected the whole shipment, because it was impossible to separate the stramonium from the hyoscyamus and the analytical department would not take the responsibility upon itself to accept the drug as stramonium.

CONIUM LEAVES.

All the samples received by us during the past year or two have been either entirely inert or contained only small traces of coniine. The leaves were evidently not adulterated and showed the characteristics of conium leaves. I myself once supervised the harvesting of conium leaves in Germany many years ago. The laborers put the leaves, as soon as they were picked, into potato or grain sacks, and the men were told not to press the leaves too hard into the sacks. There is considerable heat produced in only a few minutes, if the leaves are pressed too hard, and by this heat the coniine is either evaporated or decomposed. Assays made from leaves taken from different sacks showed plainly that leaves collected on the same field assayed much higher if pressure, and therefore heat, had been avoided. I think the right way of collecting the leaves on the field has much to do with their respective activity or inertness, although climate and weather conditions have much to do with the alkaloidal strength of the drug.

POWDERED LICORICE ROOT.

Six samples submitted at the same time from different sources showed under the microscope the characteristics of glycyrrhiza. All showed distinctly the yellow-wood fibres, the brown cork cells,

bastrings, calcium oxalate crystals, starch grains, etc., except *one* sample, the wood-fibres of which had a peculiar color and there were not many crystals of calcium oxalate visible. We made a fluid extract of each of the samples and found by our results that the suspicion we put on the one sample was well-founded. Instead of about 40 per cent. or more extractive it ran not quite 20 per cent.

Prof. Henry Kraemer outlined some months ago, in one of these meetings, that many more microscopic tests of powdered drugs should be made than is done at the present time. That Professor Kraemer was right in this is proven in this case here. The sample seen with the naked eye looked not suspicious at all and had a fairly good taste; but looks and taste often fool us. The root was evidently partly exhausted, dried again and then pulverized, adding some coloring matter and perhaps a small amount of saccharine. We could not prove this positively, the sample was very small and not enough of it was left to make additional tests. The fact is, that the microscope gave the first clue in finding out that there was something wrong with the powdered root.

ERGOT,

as we all know, is impossible to be adulterated itself. The bulk is sometimes loaded with small stones, grains, etc., but this, I think, is mostly not done on purpose. Old stock is often brightened with oil. All this is not so bad if the drug assays high enough in total alkaloid or so-called "cornutine of Keller" as outlined by that author in 1894. Recent researches of Barger and Dale, of London, on the chemistry of ergot, point to the fact that its activity lies largely in an alkaloid-like body which they call ergotoxin or hydroergótinin, thus substantiating Professor Lyons' belief that an assay based upon the determination of alkaloid unquestionably has value. The worst is that most samples in the market are worm-eaten, some are really alive with vermin. A good ergot should assay at least 0·15 per cent. "cornutine." We had some samples lately for assay which ran only 0·03 per cent., one assayed only 0·016 per cent. Of the last sample 10 pounds at least would therefore be necessary to make 1 pint of a fair fluidextract containing 0·15 per cent. "cornutine." I think it would not pay very well to use such a drug for manufacturing.

SANGUINARINE NITRATE.

Of the commercial variety, sold as sanguinarine nitrate without qualification, we found one sample to assay only 51·4 per cent., one 61·2 per cent., and another 75·3 per cent. pure sanguinarine nitrate. The highest assay ran 89·5 per cent. This commercial salt is not supposed to run 100 per cent., but the great variation in the strength makes it necessary to assay each individual lot, thereby enabling one to use the right proportions of the salt in preparations. Manufacturers of this salt should put the percentage of the pure salt on their labels, or should state on their labels that so and so much pure crystalline sanguinarine nitrate is present in the respective preparations, because the mere labeling "sanguinarine nitrate" is misleading. The retail druggist is hardly in a position to test this product.

RESIN PODOPHYLLUM.

Very few of the samples we tested lately came up to the U. S. P. requirements. Most of them contained about 10 or more per cent. of alcohol insoluble matter. We manufactured some pounds in our own laboratories according to U. S. P. method and had no difficulty in getting a product which was strictly U. S. P.

POWDERED CASTILE SOAP.

A large percentage of samples sold as "pure olive oil soap" were found to contain large amounts of animal fats.

ZINC PERMANGANATE.

During the last few months we were unable to get a zinc permanganate which was entirely soluble in water. As this product is used not only for injection but also for eye washes, it would be evidently dangerous to use a product containing insoluble matter, the latter causing irritation of the membranes to which the solution is applied. The best sample we got hold of contained 8 per cent. insoluble matter; one sample submitted to us by a prominent house contained even 32 per cent. insoluble matter. As we all know, the salt decomposes very rapidly if exposed to light and air, but the once decomposed salt is certainly unfit for medicinal purposes.

GOLD AND SODIUM CHLORIDE.

Of the many samples of gold and sodium chloride received during the last months we found none which assayed the required 30 per cent. metallic gold. Most of the samples ran between 28 and 28·8 per cent., one sample assayed far below this, namely, 24·6 per cent. metallic gold. Many samples were not mixed thoroughly, others had absorbed some moisture. Some samples were treated both by the H_2O_2 method (U. S. P. 8th Rev.) and also by the oxalic acid method (U. S. P. 1890). Both methods gave identical results. One manufacturer claimed that it was necessary, in making a correct assay, to replace the water during heating and precipitating the gold solution on the steam bath. As could be expected this scheme did not work and we were unable to obtain better results by doing so. Another claim made was that in the U. S. P. method some gold remains unreduced and is lost in the filtrate. This is hardly possible, since, if that were true, the filtrate from the precipitated gold would betray the presence of the metallic salt by a faint yellow color. This test is very delicate, as the tinctorial power of gold salts is very high and scarcely weighable quantities would impart a yellow color to the filtrate. Now the manufacturer has either to reduce the price of the *double* salt in proportion to metallic gold found (we are not willing to pay too much for *common* salt), or he has to add a little more gold chloride to his product to bring it up to U. S. P. standard—30 per cent.

ANALYTICAL LABORARORY OF THE
H. K. MULFORD COMPANY.

THE UNITED STATES PHARMACOPŒIA AS A STANDARD FOR FLAVORING EXTRACTS.

BY I. V. S. STANISLAUS, B.SC., PHAR.D.

In taking up the matter of this paper, the justness of the cause, and the position the Pharmacopœia should occupy as a standard for Flavoring Extracts become self-apparent and will serve as an excuse for this paper. For, what other standard could be selected but the Pharmacopœia for preparations of drugs? We have not one other official standard in this country. The Pharmacopœia is

the pharmaceutic as well as the Government's standard for the identification, purification, valuation and preparation of drugs and their preparations. And what are the flavoring extracts but the spirits and the tinctures of our Pharmacopœia and, therefore, justly falling under its provisions for purity and strength. True enough, the Pharmacopœia does not embrace every extract contributing to savor of our palates, but it gives standards for all the prominent extracts used, and certainly all those that can safely be used as food products.

Now, what is an "extract" (for that is the popular title applied to flavoring essences). In Circular No. 19 of the U. S. Department of Agriculture—the "Standards of Purity for Food Products"—we read: "A flavoring extract is a solution in ethyl alcohol of proper strength of the sapid and odorous principles derived from an aromatic plant or parts of the plant, with or without its coloring matter, and conforms in name to the plant used in its preparation."

We find as a foot-note in the same circular, "that the flavoring extracts therein described should not be confounded with similar preparations described in the Pharmacopœia for medical purposes." Yet a cursory examination of the matter of flavoring extracts therein described shows that, with a very few and unimportant exceptions, the standards laid down therein are almost identical with those of the Pharmacopœia. The same may be said of the savory drugs used as condiments or spices, where nearly every one of the definitions are those of the Pharmacopœia with a few minor and unimportant exceptions. Now, it is the pharmacist's occupation to prepare and dispense drugs and their preparations, under which heading these products naturally fall. Let us see whether the pharmacists have done their duty.

An examination of the "Report of the Connecticut Agricultural Experiment Station on Food Products for 1907" shows a *very* interesting fact to us pharmacists. On page 145 we read under the heading "Lemon Extracts not Found Adulterated"—"*All but two of the samples not found adulterated were sold in druggists' vials and bore no brand name.*" It is to be regretted that no statistics for Vanilla Extract were given in that report.

Now let us look at what is being said of other purveyors of flavoring extracts and in other States:

Inspection of flavoring extracts in North Dakota for 1902 has

shown that 38·4 per cent. of lemon extracts contained wood alcohol, 30+ per cent. contained artificial coloring matter, 30 per cent. contained but analytic traces of lemon oil, 23+ per cent. were below strength, and 23+ per cent. above strength—none complying with the official strength.

Of the vanilla extracts examined during the same year 30 per cent were fair extracts (of which 67 per cent were pure and high strength), 40 per cent. were mixed extracts of vanilla and tonka, and 30 per cent. were artificial vanilla extracts. Of the total, 50 per cent. were colored with caramel and 10 per cent. with coal-tar dyes.

In the report for 1903 the North Dakota Agricultural Station, in Bulletin No. 57, records 57·5 per cent. of the vanilla extracts exposed for sale to be artificial products—synthetic preparations, some colored with caramel, others with guaranteed non-fading coal-tar dyes, and some packages containing one fluid-ounce were labeled "containing two ounces."

Of the lemon extracts examined during the same year but 23·4 per cent. responded to the official requirements, the balance (76·6 per cent.) were either below strength, artificially colored, contained low percentages of alcohol, or defective in all three directions.

Now as to 1904. The North Dakota Commissioners' report for that year shows that 50 per cent. of the lemon extracts were artificially colored, 64 per cent. contained wood alcohol, and the lemon oil content varied from 0 per cent. to 4·5 per cent., while 25 per cent. of the samples contained no oil but traces, the average containing 2·17 per cent.

Of the vanilla extracts examined the same year only 15·4 per cent. were weak extracts, while 84·6 per cent. were synthetic or artificial extracts, and all the 100 per cent. were artificially colored.

The report from the same State for 1905 reveals the following figures: Lemon extracts, 34 per cent. below strength, of which about 12 per cent. contained no lemon oil at all, 15 per cent. contained artificial color, and 1·8 per cent. contained wood alcohol (1 sample in 56). Vanilla extracts—of 42 samples examined 14 were illegal, being either synthetic, artificially colored, or artificial substitutes, showing thus that 33⅓ per cent. were illegal. The other extracts examined that year were orange, which was bad, and peppermint, which was questionable; and of the extracts not embraced

in the Pharmacopœia, raspberry, strawberry and rose extracts, when examined, proved to be artificially dyed with good coal-tar dyes and guaranteed not to fade.

Inspection of extracts in North Dakota in 1906, has shown that only 44 per cent. of lemon extracts responded to the official strength, while 56 per cent. were deficient in strength, artificially colored, and one sample, indeed, contained as little as 0·31 per cent. of oil. Of the vanilla extracts examined, 60 per cent. were either artificially colored, synthetic products or short in measure, and only 40 per cent. answered standard requirements. Of miscellaneous flavors, representing wintergreen, orange, compound banana and raspberry extracts, *not one* responded to either the official or legal standards.

Here is the State of Massachusetts, considerably further east than North Dakota, and examining the reports of the Massachusetts State Board of Health for 1901 we find the following more interesting figures: Of 167 samples of lemon extracts examined, representing about 100 brands (every brand sold in Massachusetts), 139 samples were classed adulterated, or about 83·25 per cent., and only 16·75 per cent. were up to the standard. Of the inferior or adulterated extracts 42 samples contained *no* lemon oil at all, and one was made of oil other than lemon. In alcohol strength they ranged from 4 to 45 per cent., usually colored with either dinitro-cresol, tropæolin, or coal-tar dyes, or turmeric. In the vanilla extracts examined, such appetizing substances as bay rum, burnt sugar, balsam peru, etc., were found. They were either very poor extracts or entirely artificial, and their alcohol content ranged from 5 per cent. to 20 per cent.

This conspectus, covering the examination of flavoring extracts in but two States—North Dakota and Massachusetts—is very interesting to us pharmacists for two very important reasons:

First, because it demonstrates that 66+ per cent. of the flavoring extracts examined in North Dakota were illegally exhibited for sale by grocers, department stores and dealers in table luxuries.

Second, because the examination of the tables exhibited shows uniformly that almost all, if not quite all, the samples were made by wholesale grocery-supply houses and other self-styled and so-called "extract manufacturers"; and in Massachusetts the conditions were equally bad, and in some cases worse.

Let us next take a look in another direction, in a direction where

men daily engaged in the examination of food products intended for human consumption are carefully watching over the public's well-being. Let us examine the resolutions adopted at the Food Commissioners' Conference:

Resolutions adopted at the Conference of Food Commissioners, September 17, 1907, held at St. Paul, Minn., for the States of Illinois, Iowa, Minnesota, Wisconsin, North and South Dakota.

DEFINITION OF AN "EXTRACT."

(5) *Resolved*, That the terms extract, flavor, flavoring, spirits, essence or tincture as applied to solutions used for flavoring food products are held to be synonymous, but the use of any term in lieu of the word "extract" is deprecated as applied to flavoring solutions made from an aromatic plant or part of the plant.

(6) *Resolved*, That any other flavoring extract recognized in U. S. Circular No. 19, and complying with the standard laid down in that circular and free from artificial color, may be sold if the face label on both bottle and carton contain the following information:

First. Net weight or measure.

Second. Brand or trade mark (optional).

Third. Name of extract as recognized in Circular No. 19.

Fourth. Percentage of alcohol by volume.

Fifth. The true name and business address of the manufacturer.

(7) *Resolved*, That the terms "double" and "triple," etc., as applied to flavoring extracts, be held to mean respectively two or three times the minimum strength required by the standards of U. S. Circular No. 19.

(8) *Resolved*, That the term "concentrated" is false and misleading.

(16) *Resolved*, That such terms as "extra quality" and "first quality," as applied to food products, is deemed *misbranding, unless* the quality of the products is corresponding.

The convention further adopted the Standards of Purity for Food Products stated in U. S. Circular No. 19, where Resolutions 1 and 2 read as follows:

That extract of vanilla must contain no artificial color, and must contain 40 per cent. of alcohol by volume (this shown upon the label). Extracts other than those of pure vanilla must be labelled as: "Vanillin Flavor," "Coumarin and Vanillin Flavor," or "Artificial Vanillin," etc., stating also the alcohol strength.

The artificial flavors, such as pineapple, strawberry, raspberry, etc., must be produced from "harmless" substances, must be free from artificial color, must contain no statement or design to deceive the purchaser. Artificial extracts will not be permitted where true extracts can be produced. (The form of labelling must be the same as under vanilla.)

One of the biggest "holes in heaven," punched by the "Pure Food and Drug Regulations," is the requirement of the Association of Food Commissioners, that all artificial extracts of such drugs as pineapple, banana, raspberry, strawberry, etc., be labelled as "imitation extracts." These "extracts" have for many years been sold to some of the more or less ignorant bottlers of beverages as "natural extracts," beautifully colored, of course, and usually marked from two to ten "X," thus purporting to be of from two to tenfold the strength of the "druggists' extracts."

Now these artificial fruit essences must, in the future, go *uncolored;* they must be labelled "imitation extracts;" they must show their "true alcohol content;" they must give "the true name and address of their manufacturer," and, worst of all, they cannot be marked "double" or "quadruple X," or "extra quality" (all of which statements commanded an *extra price*) and they *cannot* be offered for sale *where true extracts can be produced.* "Und da liegt der Hund begraben."

For years and years the extract manufacturers offered for sale these products as bona fide, highly concentrated extracts, extracting correspondingly higher prices for each "X" upon the label, and claimed the products to have been prepared from "fresh fruits." How can they now face the bottlers and admit their guilt? How can they (and they must, to meet competition) drop from their high-priced scale to the low prices which cheap products command?

Now, what are the "artificial fruit essences?" The banana essence is a solution of butyric ether and amyl acetate in alcohol. The pineapple essence is made by dissolving butyric ether in alcohol. The strawberry extract is a mixture of nitrous ether, acetic ether, butyric ether and methyl salicylate in alcohol. The raspberry extract is a mixture of the above strawberry extract with the addition of benzoic and œnanthic ether. And these simple mixtures may be repeated for all the flavors in creation. They are all simple, all inexpensive, and all surrounded with a mantle of secrecy—of mystery.

Now, what are the natural flavors, let us ask? These may be divided into (*a*) those prepared directly from the fruits or odorous and sapid principles of aromatic plants or plant-parts; (*b*) those made by dissolving the essential oils of the plants in alcohol.

To the first class belong the extracts of raspberry, strawberry, pineapple, banana, etc. These are all made about as follows (taking strawberry extract as an example): Four and a half pounds of wild strawberries are bruised and covered with three quarts of 90 per cent. alcohol, macerated for about a month and filtered. The yield will be about one gallon of strawberry extract. But this strawberry essence is made from the fruit which is in season but two months of the year, and when the crops are small, the price will, and of necessity must be, higher, and the method of production slow and expensive.

To the second class belong the official spirits and tinctures like cinnamon, wintergreen, anise, peppermint, ginger, vanilla, etc. These are made by simple solution of the oil in alcohol, as, for example, the 10 per cent. spirit of cinnamon, or by maceration and percolation, as the 10 per cent. tincture of vanilla, or the 50 per cent. tinctures of lemon and orange peel made by maceration, or yet the 10 per cent. spirit of peppermint made by solution and maceration.

Now, it is self-apparent that all these preparations come within the province of the pharmacist. It is for us to protect our rights; it is for us to stand by the standard and to require all other corresponding preparations to respond to the tests and requirements laid down in our national standard, which is the United States Pharmacopœia.

And this is not the only phase of the question. There is another. Any of the so-called spices, like cinnamon, cayenne pepper, caraway and allspice are drugs, the doses of which lie between one and fifteen grains. Spirits like those of bitter almond, cinnamon, wintergreen and peppermint are all directed in the Pharmacopœia in doses less than 60 minims. It should be remembered that in the State of Pennsylvania drugs whose doses are less than 60 grains are considered poisons. Now, gentlemen, properly speaking these come within the province of the qualified pharmacist (whose qualification was attested by registration before the State Pharmaceutical Board). It is, therefore, in my opinion, illegal to expose these arti-

cles for sale in other places than pharmacies or drug stores. I hold, further, that the making of such dangerous preparations as the spirit of bitter almond (which may be taken as an example) is not a safe article in the hands of anybody but a qualified pharmacist, and the only safe place for its disposal is a pharmacy, and *not* a general store. This is of great importance to us pharmacists to know, and also to know the opinion as handed down by the Supreme Court of Illinois in the case of the Illinois State Board of Pharmacy against a Chinese laundryman prosecuted for selling opium. In handing down the decision the Court held:

First: That opium is a drug and not an article of ordinary merchandise.

Second: That any place where drugs and medicines are sold is a drug store within the law; and I hold, genlemen, that this decision is of the greatest importance to us. It defines the drug store and the position of the pharmacist. The substances mentioned are as much drugs as opium, and the preparations of oil of bitter almond more dangerous than opium; therefore the drug store is the proper place for their sale, the pharmacists their rightful manufacturers, and the United States Pharmacopœia the proper standard within the law.

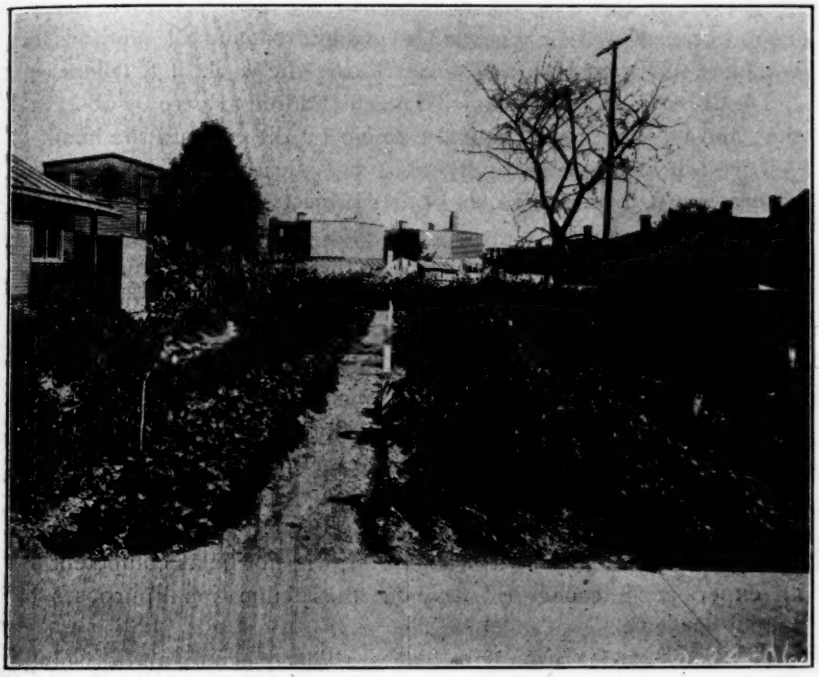
SCHOOL GARDENS.

By William McIntyre,
Chairman of Committee on Special Schools, Board of Public Education, Philadelphia.

For many years school gardens have been a feature of public school education in Europe, and, to quote Helen C. Bennett,[1] "An idea of the extent to which this branch of education is carried on in European countries may be obtained from the statement that in Austria there are no less than 8,000 school gardens; in Sweden, 2,016; while in France practical gardening is taught in 2,800 primary and elementary schools." And now a widespread movement for their establishment exists in the United States, school farms having been conducted in some of the larger cities of the East, notably New York, Boston, Philadelphia and Washington for some

[1] *The American Monthly Review of Reviews*, April, 1904.

years past. It is also of interest to note that in Porto Rico the United States Government maintains school gardens in connection with every public school, the teachers being regularly trained for the work in a course of theoretical and practical lessons on agriculture. Here in Philadelphia, during the year past, there were maintained by the Board of Public Education, ten gardens, having a total area of 8½ acres.



A Garden in a School Yard.

Some of the arguments set forth by the Public Education Association of Philadelphia in favor of school gardens are as follows:

The Objects of School Gardens.—To dispose children favorably toward manual labor, by giving a much needed industrial supplement to the confining book training and almost exclusively academic ideals of the schools.

To take children off the streets in the vacation period, and still give only pleasurable occupation out of doors.

To teach the elements of the industry on which life principally depends—agriculture—and thus promote distribution of population in rural districts, instead of continued concentration in cities.

How Gardens are Educational.—To be of educational value, it is not enough to provide gardens with tools and a gardener. The gardener or laborer is needed only as a janitor, and for work that is too heavy for children.

Why Teachers are Needed.—For any *educational* results to be accomplished, the constant direction of trained teachers is necessary, because of their knowledge of children and of methods of teaching. Discipline and nature talks are the work of teachers.

The Work of the Teachers.—To teach children to learn by observation, and to give them practical training by the eye and the hand.

To teach children to apply what they learn from books, as to nature study, mensuration, and other subjects, without the strain of additional indoor work.

To influence character by appeal to their love of nature.

To prepare children for citizenship by teaching, practically, the care of private and public property.

To mold character by demanding independence, each child being dependent upon himself in a garden for the results of his labor.

To impress practically and theoretically the law of sequence, one event proceeding from another as its direct consequence.

To educate the emotions, by teaching care and protection of tender, growing things.

A *gardener*, no matter how excellent, will not be as competent as an experienced teacher to carry out these educational purposes of school gardens.

A school garden usually measures about one acre, and is subdivided into small individual plots, larger or class plots, a centre and border, for flowers. The yield from the small plots belongs to the children who cultivate them, that from the class plot belongs to the garden. The beautiful flowers are taken to the pupils' homes or made into bouquets and sent to the hospitals for the sick.

One supervisor, nine principal and ten assistant teachers, with six gardeners, were employed. The total cost to the city, for the season, in material and salaries, was $11,035.

Accurate records are kept, including the amount of produce per child, the attendance and effects of the work upon the pupils' phys-

ical, mental and moral being. The total attendance here was 90,919 boys and girls, with an average daily attendance of 627, the division by sex being about equal.

The following table is not without interest, showing, as it does, the yield of produce on one plot 6 by 10 feet:

Lettuce heads, 19; radishes (two crops), 42 bunches = 510; turnips, 25; beets, 25; spinach, 3 pecks; wax beans, 3 pecks; tomatoes, 3 pecks; lima beans, ⅓ peck. The question of financial gain is not held out to the children, nothing being allowed to be sold in the garden; but, nevertheless, since all the produce belongs to the little farmer, it may be found wise for the parents at home to purchase the produce by way of encouragement.

The cold rain of spring and the heat of summer did not lessen the enthusiasm necessary to transform waste lands, covered with rubbish, into orderly, beautiful gardens. Here is a strong argument for gardens as a factor in municipal improvement, but stronger still is the argument in favor of gardens as a factor for the development of the boys and girls themselves.

Realizing the neglected condition of many of the back yards at their homes, the children were urged to start little gardens of their own. All plants that are adapted to transplanting, government seeds and others were given them, with the result that 494 home gardens were made.

The general interest maintained by the pupils and their deportment precludes all thought of discipline. While sections of classes are in waiting for lessons, a playground in an adjoining field will often be an acceptable place for passing time, but we find that the average child looks upon work or play according to the manner in which it is presented. School gardens furnish an industrial playground for six months' time, affording practical manual training object lessons in plant life, and a study of elementary agriculture as well as the proper use of tools and their care. They teach what soil is, the reasons for fertilizing it, the influence of moisture, and how to maintain proper soil conditions by plowing, harrowing and the rotation of crops, a little of chemistry and nature's laws. They supply nature-study and drawing materials to nearby schools. Advantageous and disadvantageous worms, insects and birds, all receive a share of attention, and many specimens are mounted and correctly named.

The growing of vegetables and flowers is not the main object sought in school-garden work. Their real value depends upon their power to arouse and confirm in the child good traits of character.

The methods pursued lead to an appreciation of the dignity of labor, which in turn may develop into an intelligent interest in the work of the field.

It has been possible to secure young women teachers who have the qualifications to give instruction in the study of plant life and related biological sciences such as are required in a work of this kind. The course of study is too long to present here, but it is systematic and presented in such a way as to hold the interest of the children.

A visitor to the gardens wrote: "The result both as to the fruits gathered and the adornment of unsightly lots was very creditable. The great value of this work, however, is unseen. The child who plants the seed, watches it germinate and grow under his care, who sees the flower and then the fruit, has little room for impure thoughts and feelings. The wonder and beauty of nature's laws are seen and felt day by day, stamp their impress on the mind and heart of the child and bring him very close to the One who gives life to all.

"There is no life for a child that equals the country life. Its close companionship with nature, its silent, unconscious influences, give a moral and physical strength supplied in no other way.

"The school garden gives the child of the city a glimpse into this life, and who can measure the value to him of this brief companionship with nature? Under the wise direction of his instructor it becomes to him much more than a glimpse."

In conclusion, it may be stated that the gardens have grown a few plants of interest to the pharmacist.

CORRESPONDENCE.

OIL OF BITTER ALMONDS.

Prof. Henry Kraemer, Editor AMERICAN JOURNAL OF PHARMACY:

DEAR SIR.—I would be pleased if you would insert the following correction concerning my recent article on "Oil of Bitter Almonds" in the forthcoming number of the AMERICAN JOURNAL OF PHARMACY.

On page 156, line 11, the word "benzo-nitrile" should be "phenyl oxyaceto-nitrile." Through an error in the manuscript sent you this incorrect word appeared. Very truly yours,

FRANK O. TAYLOR.

DETROIT, MICH., April 16, 1908.

BOOK REVIEWS.

THE PHARMACOPŒIA AND THE PHYSICIAN. By Robert A. Hatcher, Ph.G., M.D., and Martin I. Wilbert, Ph.M. Second revised edition. 485 pages, with excellent index. American Medical Association Press. 1908.

This is distinctly a book with a purpose, and a most worthy purpose—that of familiarizing the medical profession with the official drugs. It is a notorious fact, conceded by all medical teachers, that until quite recently materia medica has been the worst-taught subject in the whole medical curriculum. Most of the men now in practice were obliged to acquire the greater part of their knowledge of this subject after graduation, without teachers—or rather with worse than none! The manufacturers of the various proprietary specialties stood quite ready to supply information, unlimited in amount and attractive in appearance, but distinctly one-sided in quality. This teaching naturally took the form of extolling the more or less imaginary advantages of these proprietary drugs over the official, neglecting entirely the often much more substantial disadvantages. Most physicians accepted these statements as facts, with quite childlike confidence, forgetting that the official drugs had successfully stood the test of time, and that the specialties had scarcely been tried. This confidence so emboldened many of these proprietary houses that conditions became not only intolerable, but absurd, furnishing a well-prepared soil for the seeds of reform. These were sown by the appointment of professional scientists to the chairs of pharmacology and materia medica in a few of the better medical schools. The experiment was so successful that it extended rapidly to more and more of such schools, and the graduates of the present day are not quite so easily imposed upon. At the same time, the enlightenment of the older graduates was undertaken by their

national organization, the American Medical Association, through its Council on Pharmacy and Chemistry. These manifestations of interest on the part of the medical profession aroused the more progressive pharmacists to renewed activity, until even the N.A.R.D. is taking a hand in the propaganda.

This book of Hatcher's and Wilbert's is destined to be a most valuable instrument in this broad movement of reform. Its direct aim is to give physicians a glimpse—for some a revelation—of the rich therapeutic armamentorium of the U.S.P. and N.F. It does not pretend to be either a reference or a text-book, but rather a readable presentation of the practical phases of the subject—the manner in which therapeutical indications can be met by official drugs; the preparations and combinations in which these may be prescribed, and such pharmaceutical properties as are important to the physician. The authors do not look upon the Pharmacopœia and Formulary as idols; they do not hesitate to criticise the shortcomings of these works; neither, on the other hand, do they hesitate to expose the extravagant and often absurd claims of the proprietary preparations. It is quite needless to dwell upon the accuracy and reliability of the contents. No physician could take up the book without getting from it something of direct value; the early appearance of this second edition attests the general appreciation of this fact. The pharmacist also will find it not only interesting, but practically valuable, for an intelligent knowledge of therapeutical properties is indispensable to the scientific understanding of his profession; and if he is interested in the general propaganda, he cannot do better than to discuss the subjects of this book with his medical friends.

TORALD SOLLMANN.

WINDOW DISPLAYS FOR DRUGGISTS. By Harry B. Mason, editor of the *Bulletin of Pharmacy*. Detroit, Mich: E. G. Swift. Price, postpaid, $1.

This book is invaluable to retail druggists who believe in show-window advertising, which is unquestionably a paying proposition, especially in those stores located on large thoroughfares.

It has been said that "a man's face is a mirror to his soul," therefore it can be truthfully said that a drug store show-window denotes the character of the man managing the store. Mr. Mason has presented in his book over one hundred photographic illustrations of

practical window-dressing, consisting of every species of merchandise generally handled by a retail druggist, together with practical suggestions as to how to vary the exhibit to suit any condition. One of the most difficult problems in the commercial career of a retailer is how to properly display his goods to advantage. This problem can be easily solved by consulting Mr. Mason's book, and all retail druggists who have any personal pride in the attractive appearance of their stores should feel under great obligation to him for placing within their reach such an easy solution of their difficulties.

THOMAS H. POTTS.

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The meeting of the Philadelphia Branch of the American Pharmaceutical Association, on the evening of Tuesday, April 7, 1908, was devoted to a discussion on "Adulterations and their Detection."

Dr. George R. Pancoast and Mr. W. A. Pearson discussed "The Adulteration of Volatile Oils," and called attention to the difficulty of satisfactorily controlling these products by chemical means. They pointed out that for volatile oils that are used largely, if not entirely, for their odor, odor tests are perhaps the most satisfactory, particularly when combined with systematic dilution.

Mr. L. Henry Bernegau, in a communication entitled "Some Remarks on the Adulterations of Drugs and Chemicals as found in practice," gave an interesting résumé of some laboratory experiences with well-known drugs and chemicals. Of a number of samples of gold and sodium chloride that were examined, not one represented fully the 30 per cent. of metallic gold required by the Pharmacopœia. The greater number of samples varied from 28·8 to 24·6 per cent. of metallic gold.

Samples of commercial resin of podophyllin contained as high as 10 per cent of foreign matter, and even chemical substances, like sanguinarine nitrate, were found to be quite variable in composition.

Dr. Lyman F. Kebler, of the Division of Drugs, Bureau of Chemistry, presented a communication on "The Drug Laboratory of the Bureau of Chemistry as a Factor in the Detection of Adulterations."

Dr. Kebler called attention to some of the varied activities of the drug laboratory, and the attempts that are now being made to compel a reasonably strict adherence to the provisions of the food and drugs act. In connection with the work that is being done under the food and drugs act, the most evident need is the devising of improved methods for detecting the composition of the several compounds that are being marketed.

Another practical difficulty that has been encountered is the difficulty of procuring many of the necessary chemicals of the required standard for purity. To insure reasonably pure chemicals it has been found necessary to revert to the standards of the U.S.P. for 1890, as these are invariably higher than the standards of the U.S.P. 8th Decennial Revision.

One of the many practical problems that the men in charge of the laboratory are now endeavoring to solve is the question of deterioration of drugs and chemicals. For this purpose a number of drugs that are usually thought to be readily decomposed have been studied systematically to determine, if possible, the rate of deterioration under varying conditions.

In connection with the study of vegetable drugs a rather interesting complication has been developed by the discovery that the greater number of reference herbariums are far from being uniformly reliable.

This fact will require a careful review of herbariums used for comparison, and this is now being done by the officials in charge of the herbarium in the Smithsonian Institution.

In conclusion Dr. Kebler exhibited a number of samples of adulterated and sophisticated drugs that had come to his attention and also showed a number of preparations that were being marketed contrary to the requirements of the food and drugs act.

The several communications were discussed by Prof. Joseph P. Remington, Professor Stanislaus, Mr. Hunsberger, Professor Kraemer, Mr. Hilts and a number of others. A vote of thanks was tendered to Dr. Kebler and the other contributors for the presentation of interesting and valuable information.

A preamble and resolution endorsing "H. R. 16,091" was unanimously adopted.

M. I. WILBERT,
Secretary.

APRIL PHARMACEUTICAL MEETING.

The regular Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held Tuesday afternoon, April 21st, with Prof. Joseph P. Remington in the chair.

Prof. C. S. N. Hallberg, of the University of Illinois, addressed the meeting on the subject of improving the practice of pharmacy and medicine in the United States. The address was largely devoted to a consideration of that class of proprietary medicines for which false claims are made, both to physicians and to the public. The methods of advertising these preparations were described, and the statement was made that if the journals published to exploit them were not allowed second-class postal rates, these journals could not exist. Professor Hallberg said that the work of the Council on Pharmacy and Chemistry of the American Medical Association had entirely changed the attitude of the medical profession toward secret remedies. He said that the Council had been at work for about three years, and had found some 300 proprietary compounds and preparations that were true in name and composition, and in this connection said that the Council had not heretofore undertaken to investigate the therapeutic qualities of these preparations, and, therefore, it should be understood that they do not recommend them on the basis of their therapeutic properties.

Professor Hallberg also spoke of the splendid results which are attending the joint meetings of physicians and pharmacists in various parts of the country, one of them being an increase in the use of U.S.P. and N.F. preparations. The trend of the movement is, however, as he sees it, not against manufacturing pharmacists, but against the manufacturers of secret preparations or those for which untruthful claims are made.

The address was discussed by Dr. Albert M. Eaton, president of the Philadelphia County Medical Society; Dr. H. C. Wood, Jr.; Dr. C. B. Lowe, H. K. Mulford, W. L. Cliffe, William McIntyre, M. I. Wilbert, Prof. I.V. S. Stanislaus, and the chairman. Dr. Eaton stated that all of the scientific physicians in Philadelphia are in harmony with the movement to bring physicians and pharmacists together. He said that the matter had been taken up by several of the branches of the society, and that it would be considered by every branch not only next year, but every year until it is satisfactorily

settled. Dr. Eaton said that the Council on Pharmacy and Chemistry of the A.M.A. has done work which every one appreciates, and for which physicians are truly grateful, and that when the work done by the American Medical Association in 1875 is compared with that now being carried on by the Association, the change brought about amounts almost to a revolution. He then mentioned some of the facts which go to show that physicians as a class are improving not only in their attitude toward minor ethical practices, but also in regard to the kind of medical journals which they read. Another interesting fact mentioned by Dr. Eaton was that in his work as a member of the Committee on Advertising in Religious Journals of the Pennsylvania State Medical Society, he had found six journals of this class that were clean.

Dr. Wood said that he was interested in the remark that formerly when questions of mutual interest were discussed, physicians would meet in one place and pharmacists in another, and he claimed that this manner of procedure was largely responsible for conditions as they had existed in the past. He therefore urged that the members of the two callings meet in friendly concourse to consider the evils that have sprung up.

Mr. Mulford said that he had been impressed by the position taken by Professor Hallberg in advocating the use of Latin names for all preparations. He said that his firm had tried the experiment of using the official titles on their labels, and that they had received objections to this manner of labeling from jobbers all over the country, thus being obliged to print another set of labels giving the common names of the preparations. Mr. Mulford advanced the opinion that more information regarding the properties of medicines should be given by physicians to the laity, claiming that if the layman has some knowledge of drugs, he is better able to appreciate the benefits of medical treatment; and that ignorant laymen are the ones who are victims of medical pretenders.

Mr. Wilbert announced that Dr. J. N. McCormack would deliver an address on certain phases of the work of the Ameriean Medical Association at Witherspoon Hall, Philadelphia, on the evening of May 11th, and urged those present to attend the lecture.

At the close of the discussion a vote of thanks was tendered Professor Hallberg for his interesting address.

FLORENCE YAPLE, *Secretary pro tem.*

PHILADELPHIA COLLEGE OF PHARMACY.

MINUTES OF THE ANNUAL MEETING.

The annual meeting of the members of the Philadelphia College of Pharmacy was held on Monday, March 30, 1908, at 4 P.M. in the Library. The President, Howard B. French, presided. Twenty-six members were present.

The minutes of the quarterly meeting, held December 30, 1907, were read and approved.

The minutes of the meetings of the Board of Trustees, held December 2, 1907, January 7th, and February 4, 1908, were read by the Registrar, J. S. Beetem, and approved.

The President read his report for the year ending at this date, from which the following items are abstracted:

Owing to the excessive amount of work required of the electrical plant, it was found necessary to have the dynamo rewound, and to prevent a recurrence of similar trouble a circuit-breaker was placed on the switchboard.

The electrical plant is now in first-class order, but unfortunately it is too small for present requirements,, and a duplicate plant will soon be necessary.

The old Quiz room on the third story of the back building has been remodeled and provided with desks, electric lights, shelving and compartments for the use of the Department of Botany and Pharmacognosy. The cost of these alterations was $1384.37. This gives the Department double the laboratory space heretofore occupied. The new laboratory has been devoted to the uses of the Pure Food and Drug Classes, the students in Bacteriology, and those doing special work. In addition a number of students from the other classes have taken advantage of the increased facilities thus afforded for the purpose of examining specimens under the microscope, and of examining specimens composing the collections that have been placed in the laboratory.

During the past winter several students desired to take up the examination of blood, and the physiological testing of drugs, and instruction was given them on these subjects. There is a growing demand for micro-analysts, and the students are taking advantage of the opportunity offered to qualify themselves for this important work.

A door has been cut through from the Chemical Laboratory to the Chemical lecture room, which enables the Professor of Analytical Chemistry to use more conveniently the latter room in instructing his classes. Other portions of the buildings have had more or less of repairs put upon them, and the entire College is now in fairly good condition.

Early in the year the Board of Trustees authorized the Committee on Property to have plans and specifications drawn for the improvement of the Aimwell School property. The services of Messrs. Seymour Davis and Paul A. Davis, 3d, architects, were secured. Plans and specifications for a two-story and basement building were prepared and bids invited. A number of bids were received and the award was made to the lowest bidder, Mr. Herbert E. Havens.

The building as erected is a model of convenience, is now almost completed, and will be turned over to the College at an early date. It is to be utilized as a Pure Food and Drug Laboratory. The President stated that with this addition, together with the new Microscopical Laboratory, the College is in better condition for perfecting students in the analysis and examination of Foods and Drugs than any other educational institution of which he was aware. It also gives the students of the College added facilities for perfecting themselves in chemistry as applied in many of the arts and manufactures, and to qualify themselves for important positions in manufacturing plants. In this connection he urged the establisement of a Post-Graduate Course.

The work in Operative Pharmacy has been steadily advancing. The special course in Dispensing has proven of much value, and there is no doubt as to the wisdom of separating the instruction in Dispensing from that given to the regular classes.

A new field of work has been inaugurated in the department of Operative Pharmacy, which may be termed "Pharmacopœial Research." Preparations of the U. S. Pharmacopœia and National Formulary have been made by the students specially fitted for this work. Critical notes and suggestions for improvement in the processes have been made, which, it is hoped, will be of assistance to the Revision Committee of the U. S. Pharmacopœia and the National Formulary.

There is a net increase of fifty-four students over the corresponding period of last year. In the various departments of the College, viz.: Pure Food and Drugs course, Chemistry, Bacteriology, Microscopy and Special Studies, 103 students are enrolled, in addition to those taking the regular pharmacy course.

Special notice is taken of the death of the lamented Treasurer, James T. Shinn, whose death occurred suddenly on October 4, 1907. He had devoted much time and ability to the welfare of the College. and his death was a severe blow to the institution. He was a man of staunch character and lovable traits, one who will long be missed and whose life is well worthy of emulation.

Acknowledgment is made to many members and friends of the College for their liberality in contributing towards the erection of the new Annex Laboratory.

The activity of the Alumni Association continues, for which it is strongly commended.

The President expressed his appreciation of the kindly co-operation of all officers of the College, and also the hope that unity of action and earnest effort on the part of all the members will be continued in the future.

The Committee on Nominations presented their report, containing the names of the various nominees for offices, trustees and committees.

The report of the Publication Committee was read by Professor Sadtler, which stated that all bills for the year had been paid and that a balance remained to be carried over to the new account.

The report of the editor of the AMERICAN JOURNAL OF PHARMACY contained a summary of the matter that has been published during the year.

The report of the Committee on Pharmaceutical Meetings. The meetings have been held regularly during the year. The formulæ and make-up of the National Formulary received considerable attention, and the discussions were of practical interest to retail pharmacists. At one of the meetings a resolution was passed requesting an early revision of the National Formulary, and pledging the assistance of the members of the College in carrying on the work.

Curator's Report by Joseph W. England:

The Museum is in good condition, but is in need of extension in several directions. The Martindale and College Herbarium Collections should be rearranged; this will entail considerable work, as the numbers of the plants run into the thousands. It is important that some provision be made for the proper keeping and exhibition of the historical collection of the College. For this purpose new cases are needed, which could be placed in the gallery of the Museum. A series of Museum lectures is recommended to be given during the year, exhibiting not only the collections in the Museum, but also those of special historical and other interest contained in the collections of the teachers. Thus, one lecture could be devoted to the Martindale and College Collection of plants, and one to plant products, one to chemical products, and one to pharmaceutical products, etc. These lectures would be useful in making known the value of the collections, and would also open the door for the presentation of new specimens, and thus keep the collections up-to-date.

The Curator also suggested that the various collections in the College might be utilized for exhibition purposes during Founders' week in October next.

In the discussion that followed the reading of the Curator's report, Professors Remington and Sadtler commended the suggestion of having the Museum lectures. On motion, the report was referred to the Board of Trustees for consideration.

Librarian's Report by Thomas S. Wiegand:

There have been added 180 volumes during the year, and in addition a number of volumes have been donated. The library has

also been enriched by the volumes of the large number of valuable exchanges, which have been bound. There are now in the library about 12,000 bound volumes and over 3,000 pamphlets. The library has been consulted by the students more than usual, and a number of non-members have enjoyed its privileges.

Historical Committee Report, by George M. Beringer. During the past year a few additional contributions to the Historical Souvenirs and data that are being collected by the Museum have been received, notably some letters and correspondence of the late Prof. William Procter, Jr.; a letter in Latin of Baron Justus Liebig (received from Mr. Joseph Jacobs, of Atlanta, Ga.).

The exhibit authorized by the College for the Pennsylvania State Museum has been completed and forwarded to Harrisburg, where it is now on exhibition in the Museum. It consists of a series of volumes of the AMERICAN JOURNAL OF PHARMACY. A "hand made" book containing "Memoirs of Some of Those Identified with the Development of the Philadelphia College of Pharmacy." Articles of Incorporation, Constitution and By-laws of the College and a Condensed History. Announcements of the College. A booklet entitled "The Faculty of the Philadelphia College of Pharmacy." The printed text-books of Professors Remington, Sadtler, Kraemer and Moerk.

A series of photographs of the buildings showing interior and exterior views, and portraits of the presidents of the College and those who have been teachers in the College, and the present faculty. (These portraits were prepared by Mr. Gutekunst, of a uniform style and size, and a duplicate set has been prepared and retained in the College.) In this collection of the portraits of the presidents there is still lacking the portrait of Mr. William Lehman, the second President of the College, who filled that office from 1825–1829. The Committee have been unable to find a portrait of Mr. Lehman, but are continuing their search and hope to be able to supply the deficiency.

The laboratories of the College contributed to the exhibit as follows:

The Pharmaceutical Laboratory, a collection of approved packages for dispensing of prescriptions.

The Chemical Laboratory, six cards of Mounted Type Tests and Color Reactions.

Botanical and Microscopical Laboratory, four cards containing Type Specimens of Commercial Opium and Alkaloidal Constituents, Commercial Cinchonas and Alkaloidal Constituents, Commercial Cinnamons, and a Student's Case of Crude Vegetable Drugs.

A letter from the Curator of the Museum at Harrisburg states that the exhibit has proved attractive and interesting.

The committee recommend a vote of thanks to Mr. Joseph Jacobs for the autograph letter of Baron Liebig, which was, on motion, adopted.

The resignations of Doctor William S. Weakley and George Y. Wood from active membership were read and accepted.

The President made the following appointments: Delegates to the meeting of the Pennsylvania Pharmaceutical Association, to be held at Easton, June 23d, 24th and 25th, Clement B. Lowe, Mahlon N. Kline, William McIntyre, H. L. Stiles and Charles H. La Wall. Committee on By-Laws, George M. Beringer, Joseph W. England and C. A. Weidemann. Delegates to the New Jersey Pharmaceutical Association, George M. Beringer, Joseph P. Remington and C. B. Lowe.

Mr. Wilbert presented a preamble and resolution relating to a bill now pending in Congress, known as "H. R." No. 16,091, which has for its object the improvement of the pharmaceutical service in the Public Health and Marine Hospital service. Considerable discussion followed the presentation; numerous amendments and motions were made, after which a special committee, consisting of Messrs. Remington, Cliffe and Wilbert were appointed to consider the matter, who subsequently proposed the following amendment to the House bill:

"*Resolved*, That we recommend that appointments to the rank of Assistant Pharmacists be limited to graduates of pharmacy from a recognized college or school of pharmacy."

This was adopted, and copies of the preamble and resolution, and amendment directed to be sent to the chairman of the Committee on Expenditures of the Treasury Department, and the Representatives in Congress from Philadelphia.

The election of officers, trustees and committees being now in order, Messrs. Cliffe and England were appointed tellers, who, after a ballot was had, reported the election of: President, Howard B. French; First Vice-President, Mahlon N. Kline; Second Vice-Presi-

dent, R. V. Mattison; Treasurer, Richard M. Shoemaker; Corresponding Secretary, A. W. Miller; Recording Secretary, C. A. Weidemann; Curator, Joseph W. England; Librarian, Thomas S. Wiegand; Editor, Henry Kraemer; Trustees, Joseph P. Remington, Gustavus Pile and C. Carroll Meyer. Theodore Campbell was elected to fill the unexpired term of Richard M. Shoemaker, who was elected treasurer; Publication Committee, Samuel P. Sadtler, Henry Kraemer, Joseph W. England, Martin I. Wilbert, Miss Florence Yaple, Charles H. La Wall; Committee on Pharmaceutical Meetings, Joseph P. Remington, C. B. Lowe, William L. Cliffe, William McIntyre, and the editor.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

December 2, 1907. Fifteen members were present.

Committee on Property reported progress on the new Pure Food and Drug Laboratory building, which, it was stated, would be under roof by January 1, 1908.

Special Finance Committee reported progress in securing contributions towards the new building.

January 7, 1908. Eleven members were present

Committee on Property reported that weather conditions had delayed work on the new annex building.

Committee on Library reported a number of accessions to the library during the past two months.

Committee on Examinations reported as suitable candidates a number of names for the award of the degree of Master in Pharmacy.

The subject of conferring the honorary degree of Doctor in Pharmacy (P. D.), had been discussed by the committee, but no recommendation was made.

Prof. Henry Kraemer submitted the name of John J. Bridgeman, Jr., as additional assistant in the microscopical laboratory.

Prof. F. X. Moerk submitted the name of Joseph A. Wolfe as additional assistant in the chemical laboratory.

The selection of these assistants was confirmed by the board.

Professor Sadtler stated that he would endeavor to arrange for some special lectures to the students in the Pure Food and Drugs Course by the first of April.

February 4, 1908. Fifteen members were present.

Committee on Property reported that the work on the new building was progressing favorably, though it had been delayed, but it was expected that the building would be completed in about three weeks. The committee further reported that a new electric light plant would be necessary.

Committee on Library reported a number of accessions during the month.

The Special Committee, to whom was referred the selection of names from those submitted at the last meeting by the Committee on Examinations, upon whom the degree of Master in Pharmacy should be conferred, submitted five names, and their selection was approved by the board.

The Committee on Property was authorized to arrange for a formal opening of the new Pure Food and Drug Laboratory.

The Secretary of the College was authorized to sign the names of officers and faculty, deceased, on duplicate diplomas and certificates, and an engrossed foot-note on the diploma or certificate, stating that such names were signed by the Secretary of the College by order of the Board of Trustees.

George B. Evans and Richard H. Lackey were elected active members.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

OBITUARY.

JACOB A. MILLER.

Dr. Jacob A. Miller, one of the best known druggists of Harrisburg, Pa., died at his residence in that city on April 27, 1908, from cancer of the throat, he having been ill since January.

Dr. Miller was born in Lancaster seventy-one years ago. He was graduated from Lafayette College in 1858 and from the Medical Department of the University of Pennsylvania in 1861. That year he became assistant superintendent of the Pennsylvania State Lunatic Hospital located at Harrisburg.

At the outbreak of the Civil War he was assigned from General

McClellan's headquarters as a surgeon to Burdan's New York Sharpshooters and was later transferred to the Second Regiment, Rhode Island Volunteers. The last time he was ill with the exception of the illness that resulted in his death, was when he was taken sick with camp fever and sent home, when he again assumed his duties at the Insane Hospital. For a number of years in the early sixties he was county physician in Lancaster.

Forty years ago he opened his drug store at Second and Chestnut Streets and for thirty years he was secretary of the Pennsylvania State Pharmaceutical Association. He served for a number of years as secretary of the Dauphin County Pharmaceutical Association and was the first secretary of the Lancaster County Medical Association.

Dr. Miller represented the Third Ward in the School Board from 1878 to 1887.

For thirty-one years Dr. Miller was an elder in the Market Square Presbyterian Church and also clerk of the session. He taught in the Sunday-school for thirty years or more and for many years held an unbroken record for attendance.

Dr. Miller is survived by a wife and two sons: John Z. Miller, of Erie, and Charles G. Miller, of Harrisburg.